

★ Theater Air And Missile Defense Community Of Systems

Joint AIAA/BMDO Technology Readiness Conference

August 3, 1998

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Deputy For Theater Air And Missile Defense
Ballistic Missile Defense Organization

Cleared For Open Publication, Directorate
For Freedom Of Information And Security
Review, Department Of Defense

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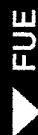


BMDO's CHALLENGE...

- Develop An FoS Interoperability Testing Approach That
 - Ensures The TMD Building Blocks "Plug And Fight"
 - Accommodates Time Phased Development Of Systems
 - Verifies FoS Interoperability Throughout Its Life

FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07	FY 08	FY 09
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PATRIOT
Advanced Capability 3



FUE

Navy Area



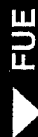
FUE

THAAD



FUE

Navy Theater Wide



FUE

ABL



IOC

Arrow Interoperability





U.S. FoS RATIONALE

- Threat Uncertainties
 - Range / Altitude Variances
 - Quantity (Raid / Campaign / Time On Target)
 - Warhead Design (Conventional / WMD)
 - Technology (Low Signature / Maneuver / Velocity)

- Defense Dynamics
 - Point Vs Area Defense
 - Military And / Or Civil Defense
 - Joint Forces Synergies
 - No Notice / Short Notice / Build Up

- Budget Constraints
 - Force Reductions
 - Acquisition Goals



U.S. FOS RATIONALE

VIDEO Insert

- Threat Uncertainties
 - Range / Altitude Variances
 - Quantity (Raid / Campaign / Time On Target
 - Warhead Design (Conventional / WMD)
 - Technology (Low Signature / Maneuver / Velocity)



U.S. FoS RATIONALE

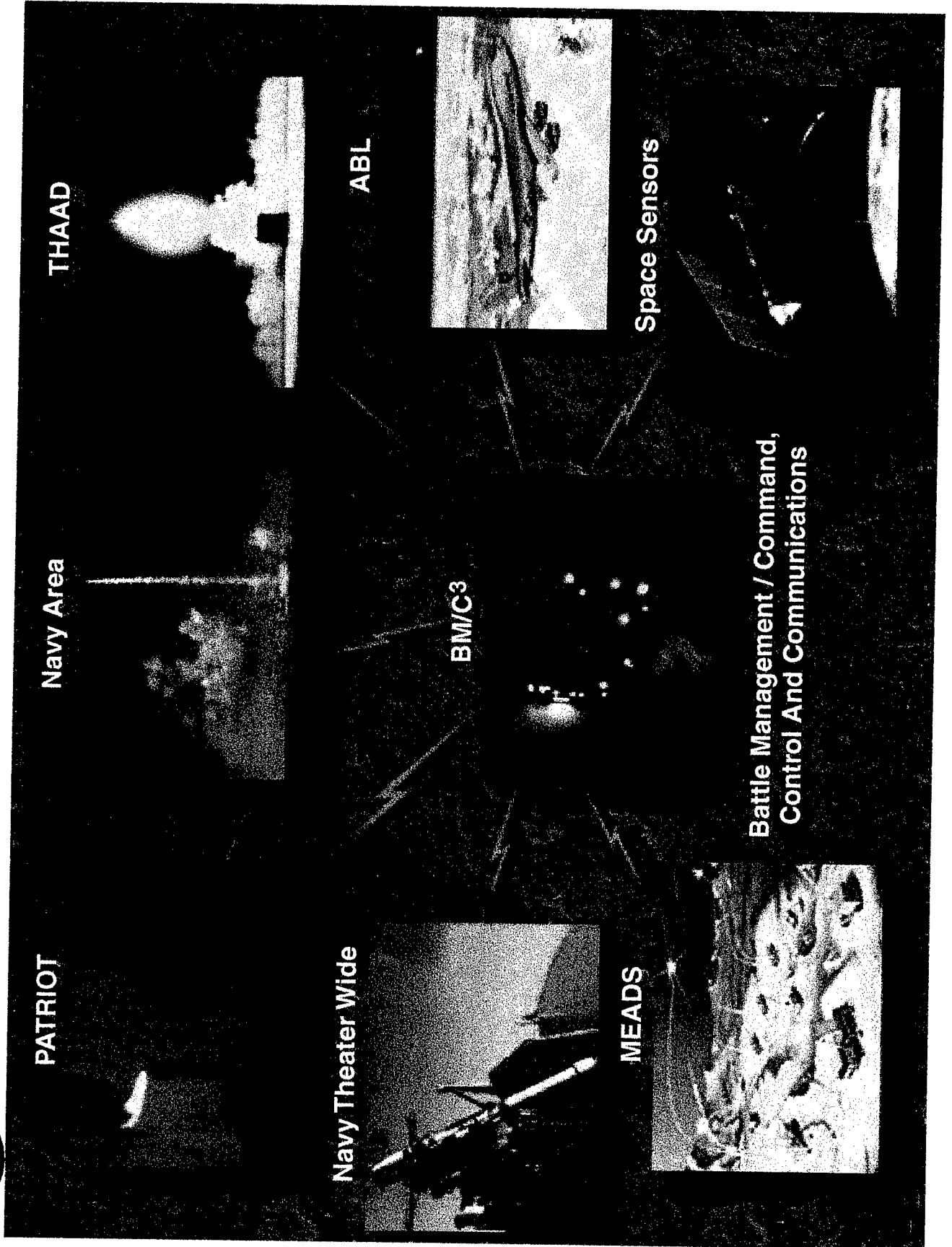
VIDEO Insert

- Defense Dynamics
 - Point Vs Area Defense
 - Military And / Or Civil Defense
 - Joint Forces Synergies
 - No Notice / Short Notice / Build Up





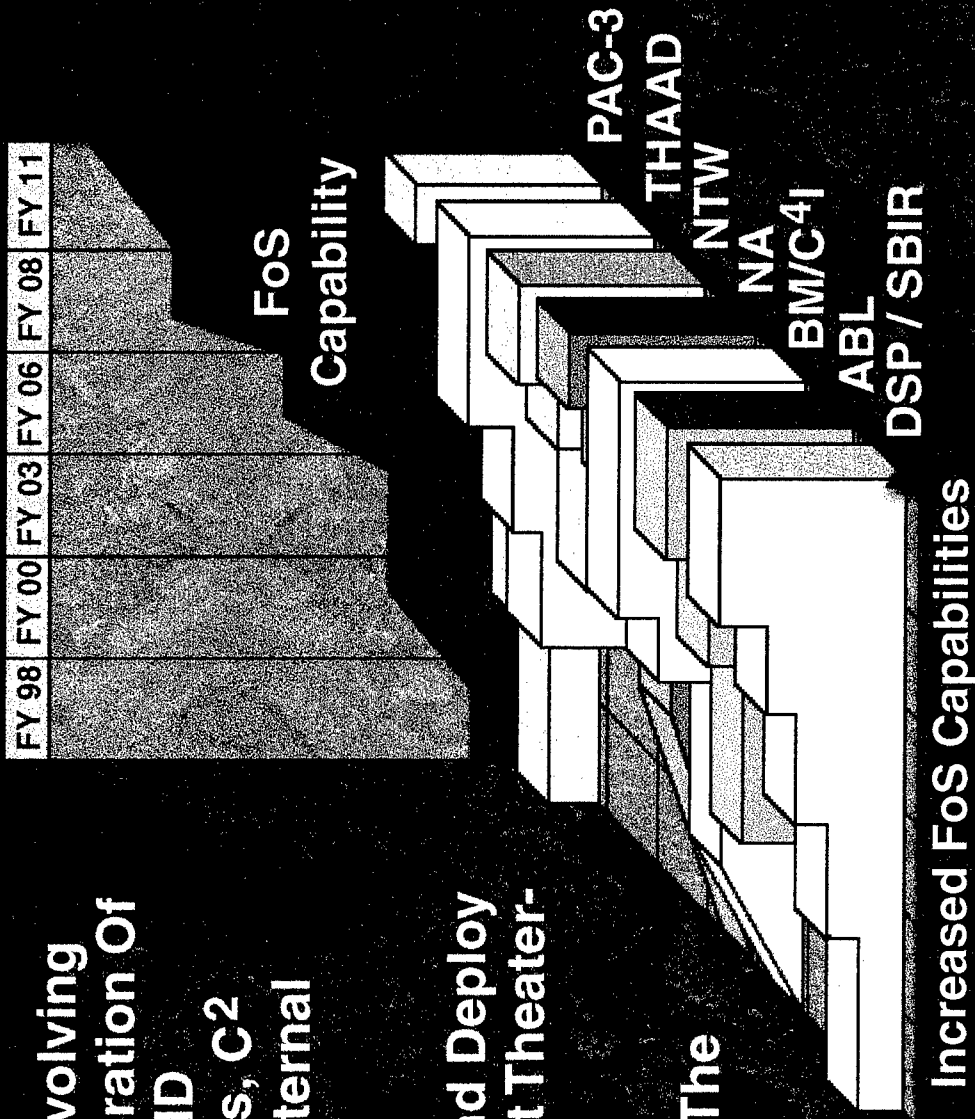
THE TMD FAMILY OF SYSTEMS





FoS CONCEPT

- The FoS Is An Evolving Flexible Configuration Of Interoperable TMD Weapon Systems, C2 Centers, And External Sensors
- CINCs Select And Deploy Systems To Meet Theater-Unique Needs
- Keep Pace With The Threat

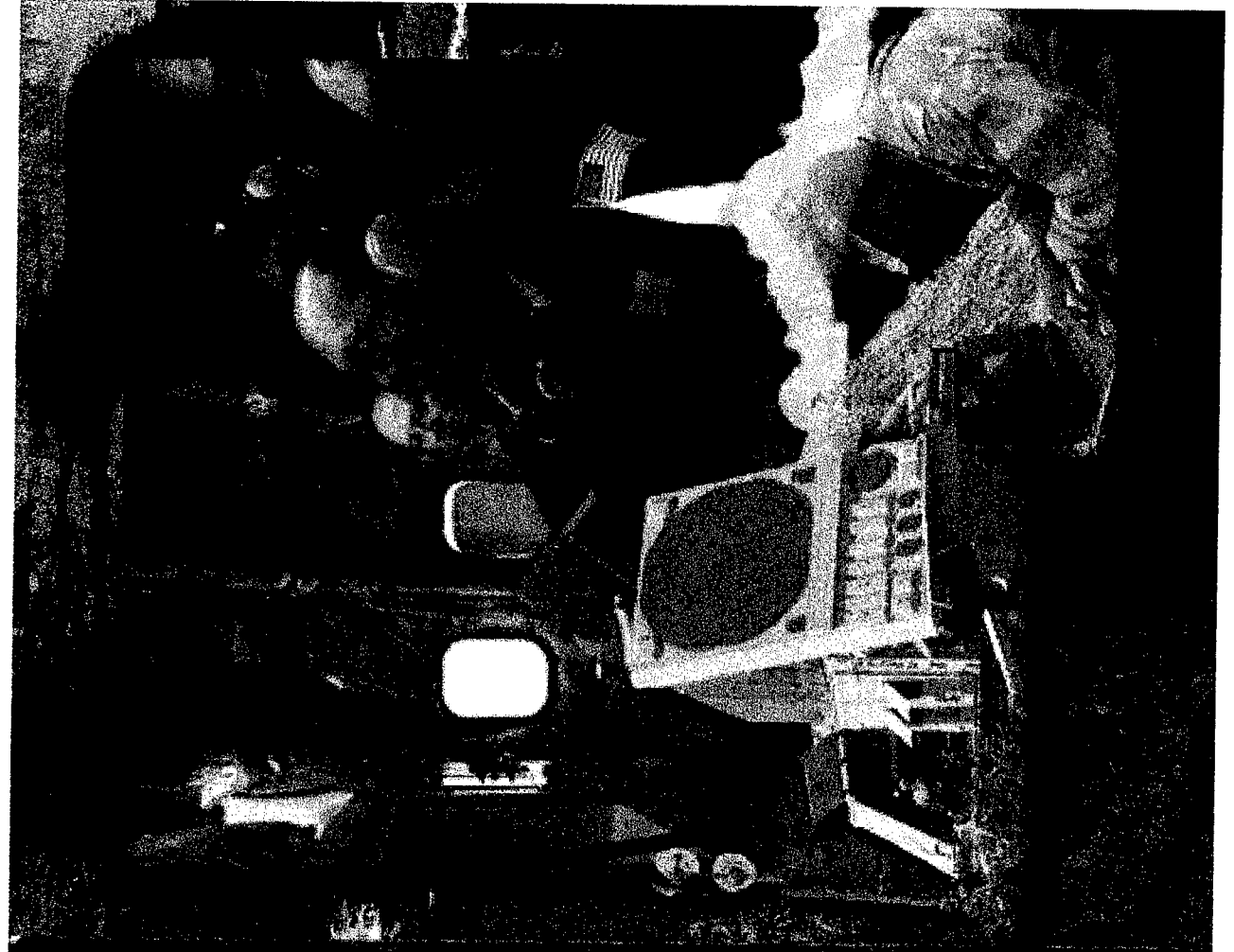


Interoperability Is Critical To FoS "Plug And Fight" Strategy



TMD FOS ELEMENTS A MORE COMPREHENSIVE LOOK

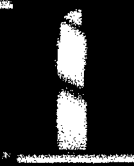
- Radios
- Computers
- Radars
- Missiles





TMD FOS ELEMENTS A MORE COMPREHENSIVE LOOK

- People
 - Tactics
 - Techniques
 - Procedures
- Theater Operations
- U.S. And Non-U.S. Forces In Strategic Alliance

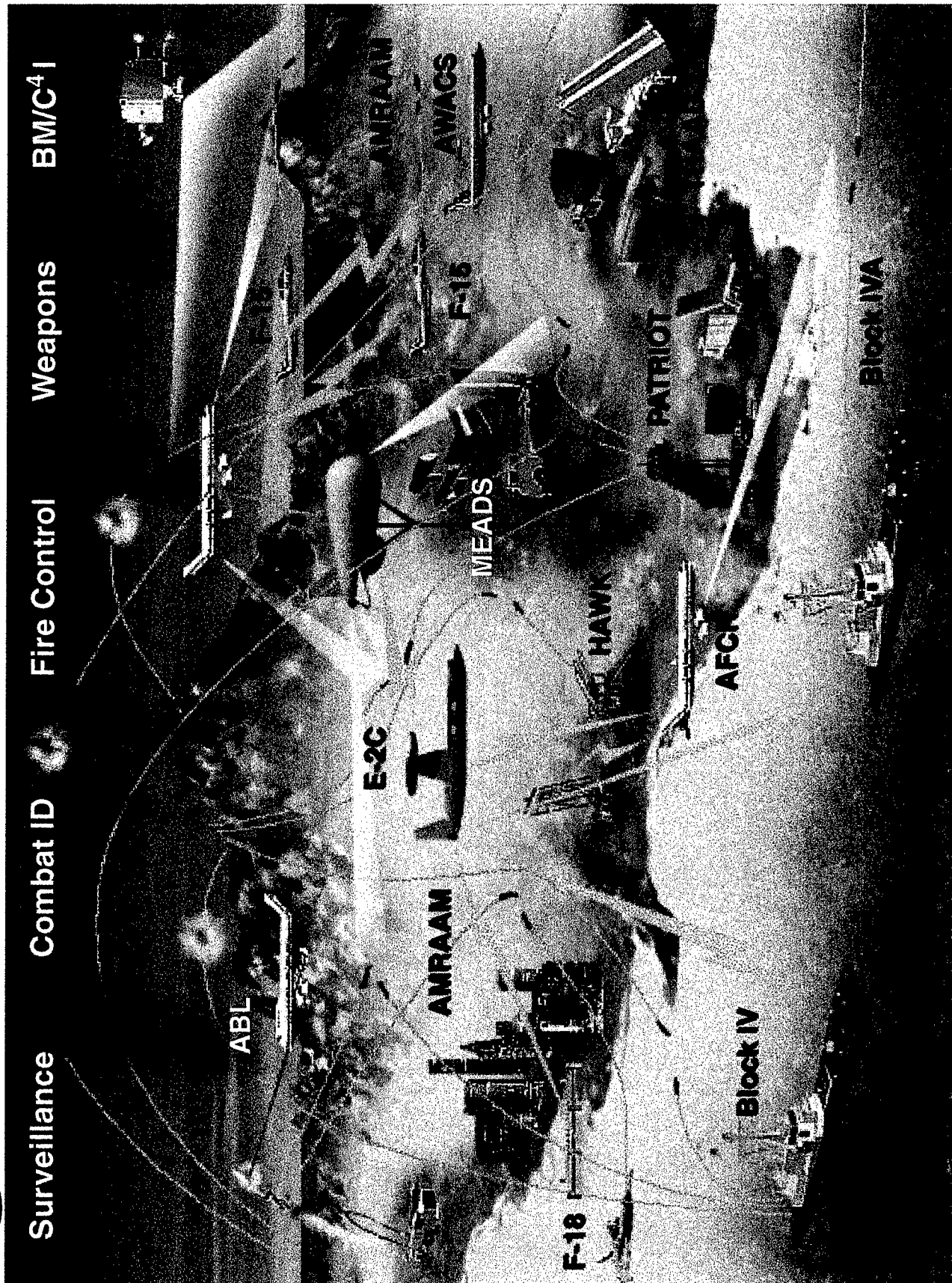


Video Insert



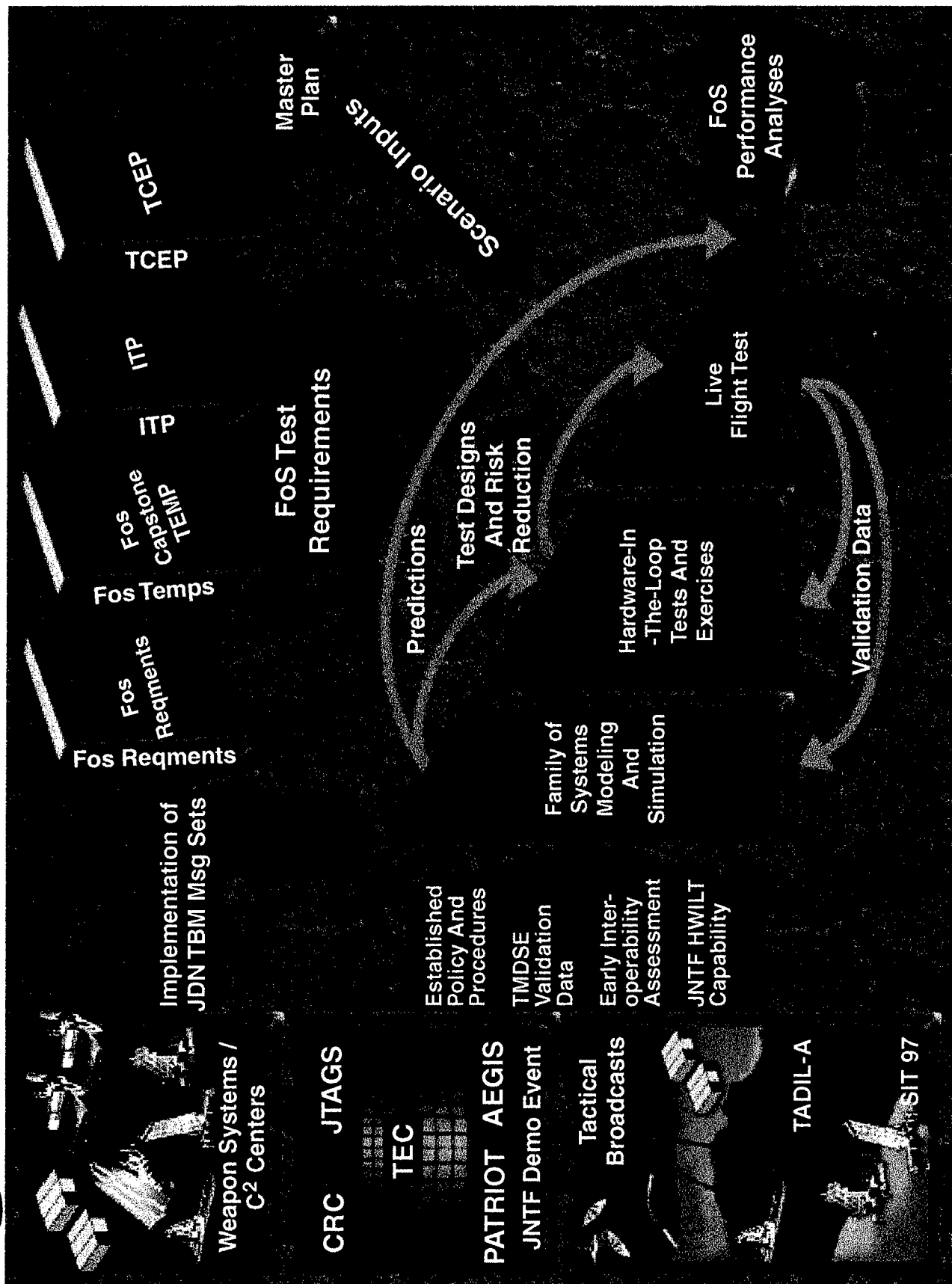


JTAMD ARCHITECTURE: THE BIG PICTURE



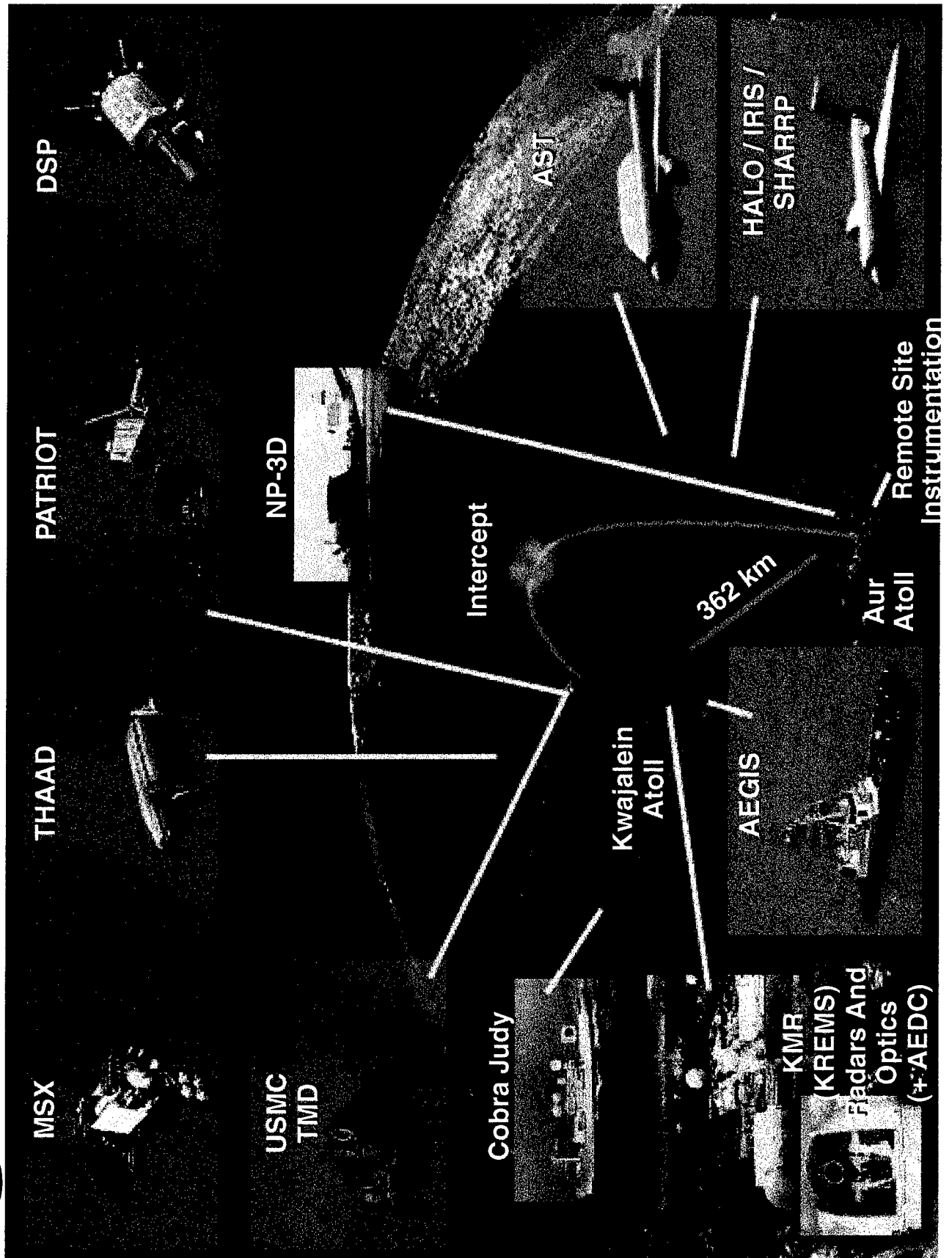


NEAR TERM FOS TESTING CONCEPT





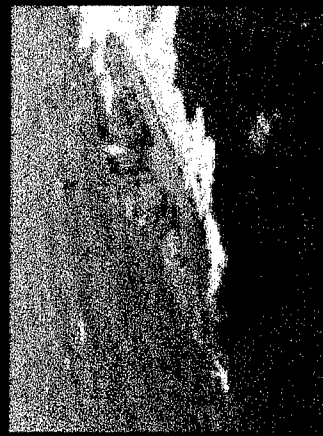
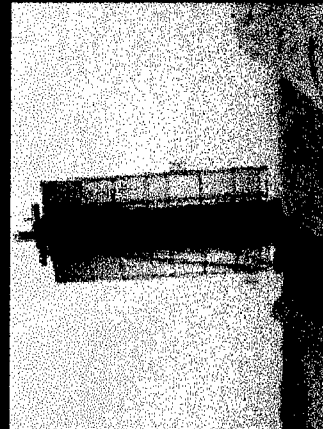
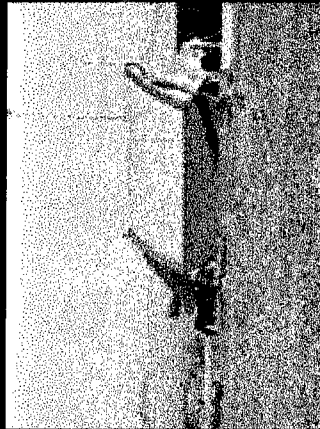
SYSTEM INTEGRATION TESTING





THE TEST

**Assumption: The Navy, Air Force And Army Can Work Together
Proof Of Assumption: The February 1997 - Systems Coordinated**

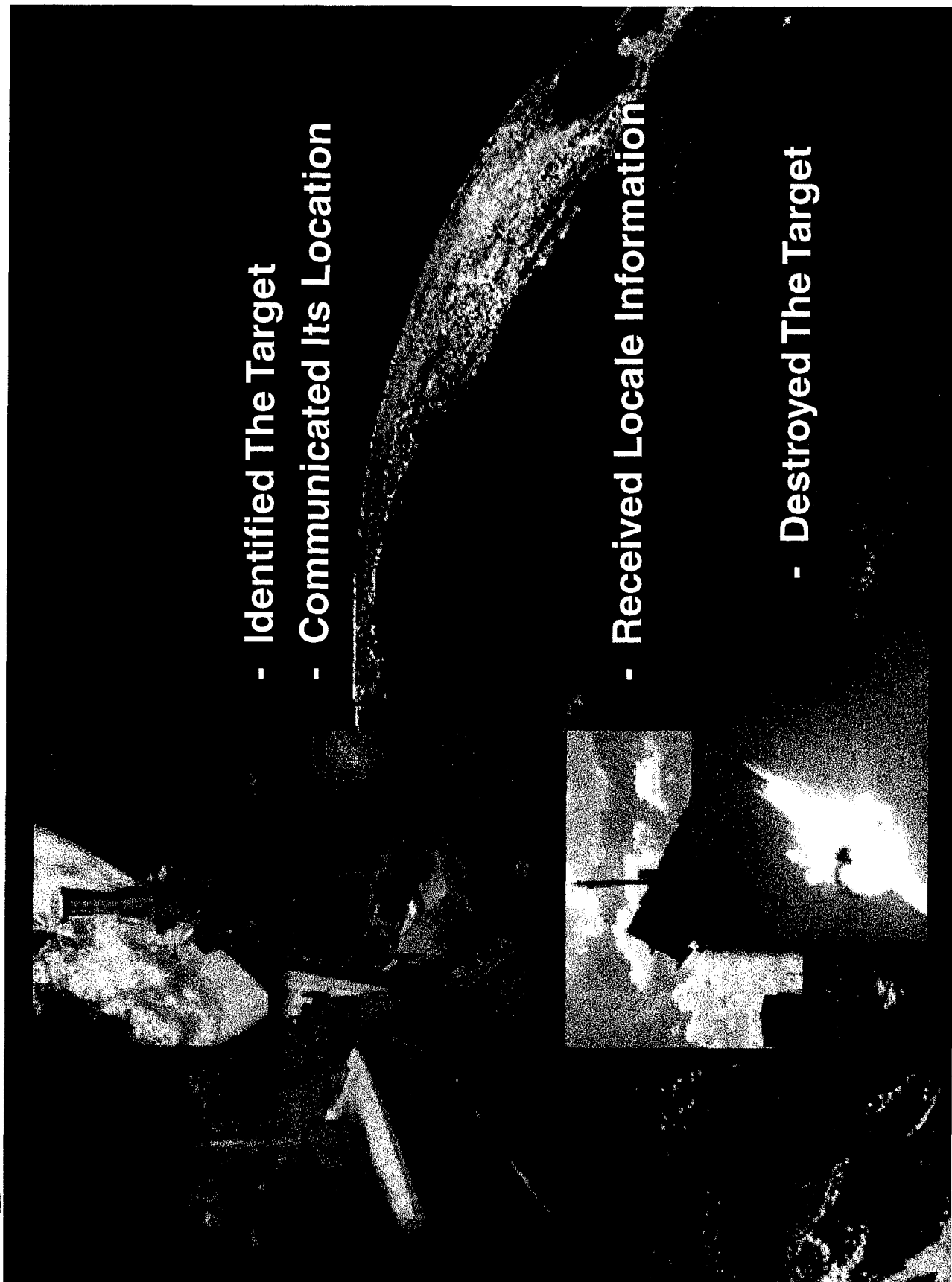


**To Track - Engage - And Destroy A
Tactical Missile**



THE RESULTS

- SHARED INFORMATION -



- Identified The Target
- Communicated Its Location

- Received Locale Information

- Destroyed The Target



TAMD STRATEGIC PLAN - AN INTEROPERABILITY FAMILY OF SYSTEMS

Goal: An Interoperable TMD Family Of Systems Designed To Meet The Needs Of The Warfighter

Tasks: Define Baseline Architecture

Gain Community Support For FoS Concept

Gain Support For FoS Acquisition Plan

Develop Modeling And Simulation Tools

Identify Non-U.S. Programs That Relate To U.S. FoS

Verify FoS Performance

Prioritize FoS Acquisition Plans

Integrate U.S. And Non-U.S. FoS Program Elements



Theater Air And Missile Defense Family of Systems Briefing For 7th Annual AIAA / BMDO Technology Readiness Conference



3 AUG 98

**Brig Gen Richard W. Davis, USAF
Deputy For Theater Air And Missile Defense
Ballistic Missile Defense Organization**



BMD PROGRAM ISSUES

Theater Missile Defense

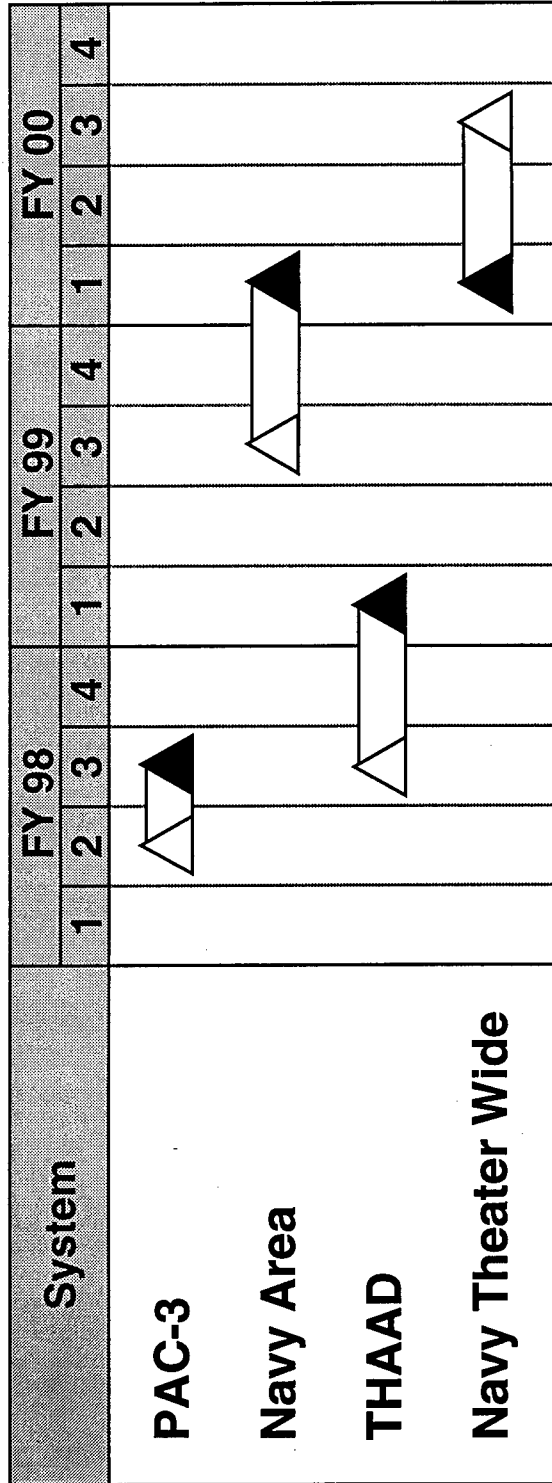
- Proliferating Threat
- Family Of Systems – Do We Need The Whole Family ?
- THAAD Program Testing – Will It Work ?
- THAAD UOES Decision
- PAC-3 Delay And Cost Overrun
- PAC-3 LRIP Decision
- MEADS Funding Beyond FY 99 ? (DoD Commitment ?)
- Joint Theater Air And Missile Defense – BMDO's Role / Vision
- NTW Funding – Can Additional Funds Accelerate The Program ?
- Welch Report On Testing



***Note: Revisions To THAAD Program And Flight Test Program Are Currently Under Review**



TBMD PROGRESS – FIRST INTERCEPTS



As Of

△

FY 99 PB

▲

FY 00 POM

- Slips Result From
 - Technical Difficulties
 - Addition Of Welch Report Items
 - Incorporating Schedule Realism
- Navy Theater Wide Move Results From
 - Better Program Definition
 - Addition Of Funding

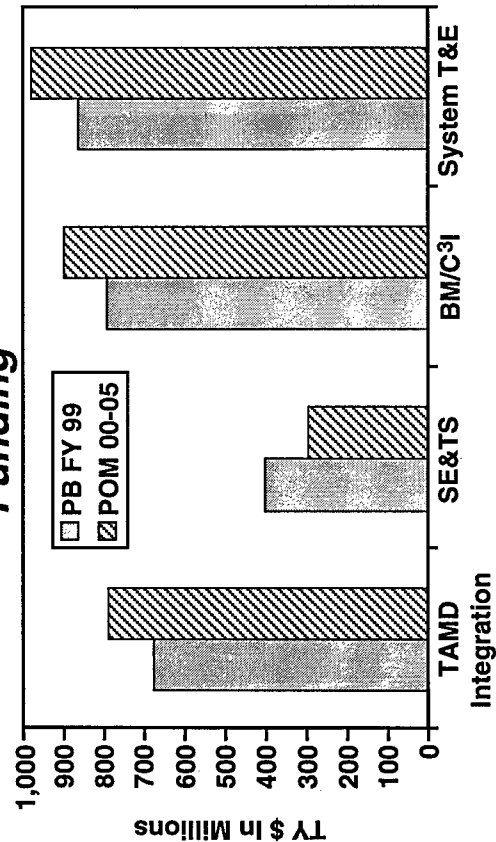


FAMILY OF SYSTEMS (FoS) METRICS

Schedule

	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
• APB						
BM/C ⁴ I						
FoS						
• PB (FY 99-03)						
BM/C ⁴ I						
FoS						
• POM 00-05						
BM/C ⁴ I						
FoS						

Funding



Key Performance Parameters

	Design	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02
• Interoperability							
• Combat ID							
• Target Engagement And Negation							
• Minimum Negation Altitude Against TBM							
• Early Warning							

Legend ☒ ≥ (0) ☐ < (0) And ≥ (T) ☐ < (T) ☐ No Data

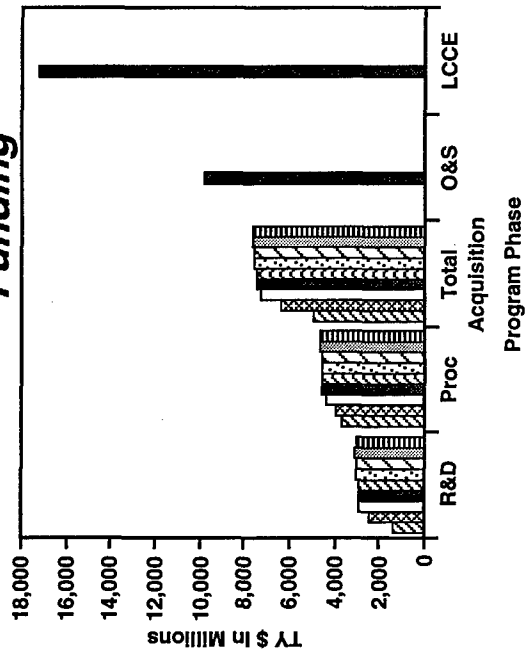


PAC-3 PROGRAM METRICS

Schedule

(Missile Quantities)	FY 96				FY 97				FY 98				FY 99				FY 00			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
• APB 20 AUG 96 (1,200)	▲ Config-1 FUE				▲ Config-2 FUE			▲ SEP	▲ LRIP Decision MAR				▲ JUL			▲ Config-3 JAN FUE				
• PB FY 99 (1,200)	▲ Config-1 FUE				▲ Config-2 FUE				▲ LRIP Decision				▲ JUL			▲ MS III DEC				
• POM 00-05 (880)	▲ Config-1 FUE				▲ Config-2 FUE				▲ LRIP Decision				▲ LRIP Decision			▲ Config-3 FUE				

Funding



Key Performance Parameters

	Design	FY 97	FY 98	Remarks
• Defended Area				
- Sector / Range				Intercept 3Q FY 98
- TBM Range				Intercept 3Q FY 98
- Keep Out				Intercept 3Q FY 98
• SSEKP				Intercept 3Q FY 98
• Mass Attack				Test 4Q FY 98
• Effectiveness				Sled Test Results And Proj. Intercept
• Radar Cross Section				Based On CDT&E And SIT 97
• Reload				LOG Demo 2Q FY 98
• Classification, Discrimination And Identification				Based On CDT&E And SIT 97

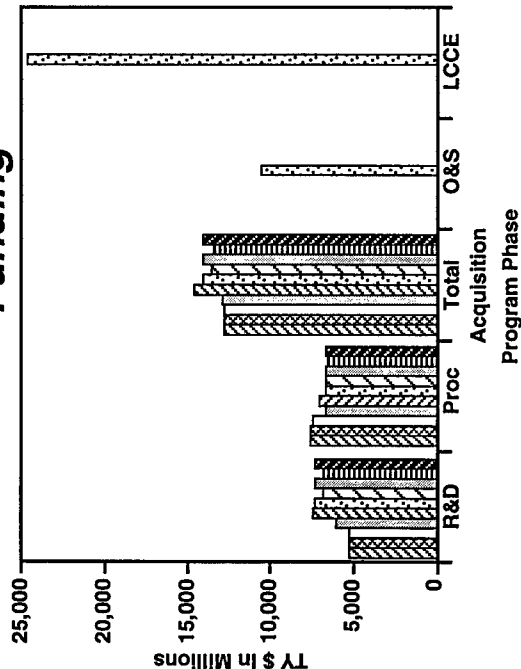
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Schedule

(Missile Quantities)	FY 97			FY 98			FY 99			FY 00			FY 01			FY 02			FY 03			FY 04			FY 05			FY 06			FY 07																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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Funding



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| <input checked="" type="checkbox"/> | DAES DEC 94 |
| <input type="checkbox"/> | DAES DEC 95 |
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| <input checked="" type="checkbox"/> | DAES DEC 97 |
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| <input checked="" type="checkbox"/> | PB FY 99 |
| <input type="checkbox"/> | DAES MAR 98 |
| <input type="checkbox"/> | POM 00-05 |
| <input checked="" type="checkbox"/> | DAES JUN 98 |

**SAR Data Not Used,
Doesn't Contain
Procurement Until
MS II**

Key Performance Parameters

Design	FY 97	FY 98	Remarks
--------	-------	-------	---------

- | | | | | Currently In PDRR |
|------------------------|--|--|--|-------------------|
| • Defended Area | | | | Currently In PDRR |
| • Degree Of Protection | | | | Currently In PDRR |
| • SSEKP | | | | Currently In PDRR |
| • Threat / Target Set | | | | Currently In PDRR |
| • Lethality | | | | Currently In PDRR |
| • Interoperability | | | | Currently In PDRR |

Legend

	$\geq (0)$
	$< (0)$ And $\geq (T)$
	$< (T)$
	No Data

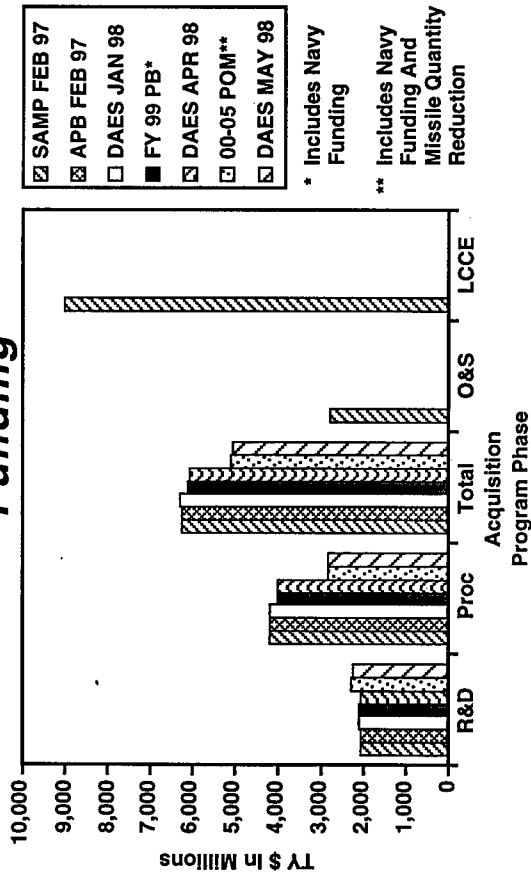


NAVY AREA PROGRAM METRICS

Schedule

(Missile Quantities)	FY 96				FY 97				FY 98				FY 99				FY 00				FY 01				FY 02			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
• APB February 1998 (1,500)					▲ MS II								Start WSMR Testing ▲ FEB AUG				TECHEVAL Start NOV				FUE JUN DEC				MS III FEB			
• PB FY 99 (1,500)					▲ MS II								Start WSMR Testing ▲				TECHEVAL Start NOV								FUE JUN DEC			
• POM 00-05 (750)																	TECHEVAL Start NOV								MS III FEB			

Funding



Key Performance Parameters

	Design	FY 97	FY 98	Remarks
• Threat Warhead	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Awaiting Intercept
• Threat Range	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Awaiting Intercept
• RCS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Awaiting Intercept
• ECM	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Awaiting Intercept
• Debris	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Awaiting Test In 4Q FY 98
• Vehicle Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Sled Test Results And Proj. Intercept
• Penalds	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Based On CDT&E And SIT 97
• Maneuvers	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Awaiting Test

Legend: ☒ ≥ (0) ☒ < (0) And ≥ (T) ☐ < (T) ☐ No Data

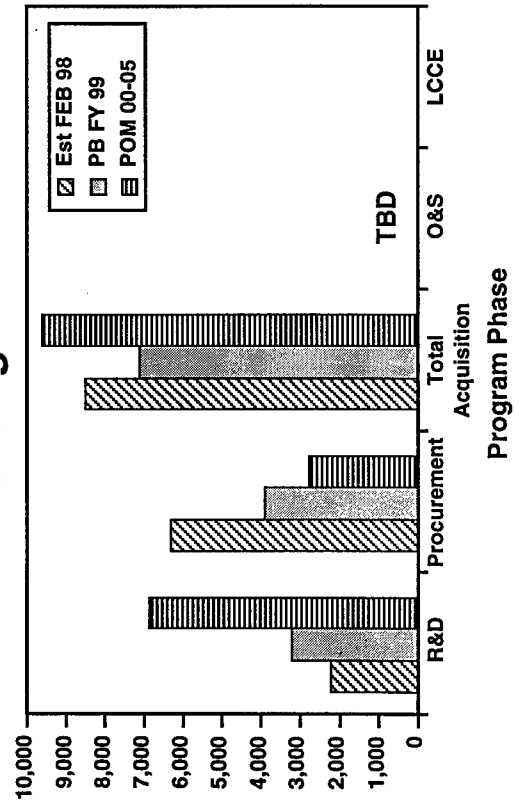


NAVY THEATER WIDE PROGRAM METRICS

Schedule

(Missile Quantities)	FY 97				FY 98				FY 99				FY 00				FY 01				FY 02				FY 03				FY 04				FY 05				FY 06			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
• PB FY 99 (650)	▲ CTV-1				△ CTV-2				△△△△ 1 2 3 4				△△△△ 4 5 6 7				△△△△ FTRs				MS II - Block I				△				DT-11 MS II - Block I				△				△ FUE I			
• POM 00-05 (480)	▲ CTV-1				△ CTV-2				△△△△ 1 2 3 4				△△△△ 4 5 6 7				△△△△ FTRs				DAB Review				△				DT-11 MS II - Block I				△							

Funding



Key Performance Parameters (Per Draft ORD Dated JAN 98)

	Design	FY 97	FY 98	Remarks
• Threat Range	■	□	□	Awaiting Intercept
• Minimum Intercept Attitude	■	□	□	Awaiting Intercept
• Crossrange	■	□	□	Awaiting Intercept
• P _{SSEKP}	■	□	□	Awaiting Intercept
• Interoperability	■	□	□	Awaiting Test In
				4Q FY 98

Legend ■ ≥ (0) ■ < (0) And ≥ (T) □ < (T) □ No Data

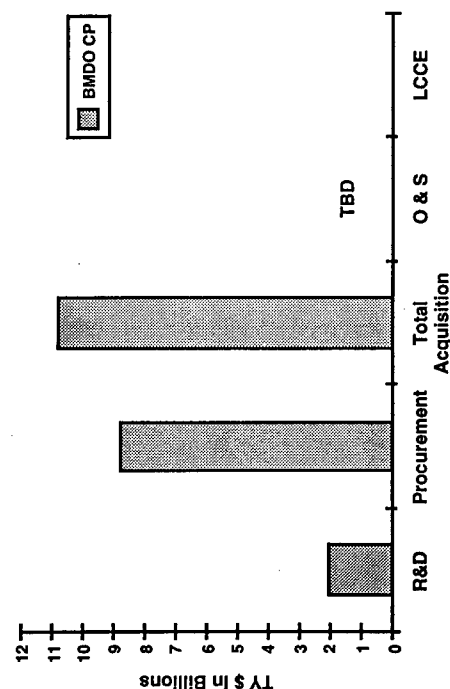


MEADS PROGRAM METRICS

Schedule

	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	FY 02	FY 03	FY 04	FY 05	FY 06	FY 07
	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4	1 2 3 4
• PDV MOU	▲ PDV		▲ D&D DAB	▲ D&D Start				▲ LRIP			▲ Production	
• PB	▲ PDV		▲ D&D DAB	(Funding Ends In FY 99)								
• POM 00-05	▲ PDV	System Design Reviews	▲ D&D DAB	▲ D&D Start				▲ LRIP			▲ OISD	▲ FUE

Funding



Key Performance Parameters

	Design	FY 97	FY 98	Remarks
• Deployability	■	□	□	Currently In PDV
• Maneuver Force Protection	■	□	□	Currently In PDV
• Counter The CM / ABT	■	□	□	Currently In PDV
• Counter The SRBM	■	□	□	Currently In PDV
• Degree Of Protection	■	□	□	Currently In PDV

Legend ■ ≥ (0) ■ < (0) And ≥ (T) □ < (T) □ No Data